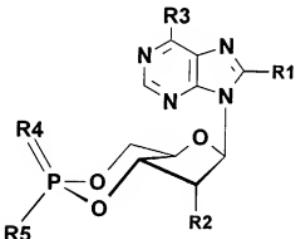


Amendments to the Claims:

This listing of claims will replace all prior versions, and listings, of claims in the application.

Listing of Claims:

Claim 1 (Amended): Compound having the structural formula (I)



and dideaza-analogues and deaza-analogues thereof, wherein:

R₁ can be independently H, halogen, azido, alkyl, aryl, amido-alkyl, amido-aryl, OH, O-alkyl, O-aryl, SH, S-alkyl, S-aryl, SeH, Se-alkyl, Se-aryl, amino, NH-alkyl, NH-aryl, N-bisalkyl, N-bisaryl, cycloalkylamino;

R₂ can be independently H, halogen, azido, O-alkyl, S-alkyl, Se-alkyl, NH-alkyl, N-bisalkyl, alkyl-carbamoyl, cycloalkylamino, silyl;

R₃ can be independently H, halogen, OH, azido, amido-alkyl, amido-aryl, O-alkyl, O-aryl, SH, S-alkyl, S-aryl, amino, NH-alkyl, NH-aryl, N-bisalkyl, N-bisaryl, NH-alkyl-carbamoyl, cycloalkylamino;

and wherein

R₄ is O(H) or S(H); and

R₅ is O(H), S(H), amino, H, alkyl, O-alkyl, O-aryl, S-alkyl, S-aryl, NH-alkyl, NH-aryl, N-bisalkyl, N-bisaryl; or

R₄ is O(H), S(H), amino, H, alkyl, O-alkyl, O-aryl, S-alkyl, S-aryl, NH-alkyl, NH-aryl, N-bisalkyl, N-bisaryl; and

R₅ is O(H) or S(H);

and pharmaceutically acceptable salts, esters, and/or solvates thereof,
with the exception of

2'-deoxyadenosine-3',5'-cyclic monophosphate; N⁶-monobutyl-2'-deoxyadenosine-3',5'-cyclic monophosphate; 2'-deoxyadenosine-3',5'-cyclic monophosphorothioate; 2'-deoxyadenosine-3',5'-cyclic monophosphoroanilidate; 2'-deoxyadenosine-3',5'-cyclic monophosphate methyl triester; 2'-deoxyadenosine-3',5'-cyclic monophosphate ethyl triester; 2'-O-methyladenosine-3',5'-cyclic monophosphate; 2'-O-ethyladenosine-3',5'-cyclic monophosphate; 2'-O-n-propyladenosine-3',5'-cyclic monophosphate; 2'-O-n-butyladenosine-3',5'-cyclic monophosphate; 2'-O-iso-butyladenosine-3',5'-cyclic monophosphate; 2'-O-methyladenosine-3',5'-cyclic monophosphate methyl triester; 2'-O-methyladenosine-3',5'-cyclic monophosphate phenyl triester.

2'-deoxyadenosine-3',5'-cyclic monophosphate;

N⁶-monobutyl-2'-deoxyadenosine-3',5'-cyclic monophosphate;

2'-deoxyadenosine-3',5'-cyclic monophosphorothioate;

2'-deoxyadenosine-3',5'-cyclic monophosphoroanilidate;

2'-deoxyadenosine-3',5'-cyclic monophosphate methyl triester;

2'-deoxyadenosine-3',5'-cyclic monophosphate ethyl triester;

2'-O-methyladenosine-3',5'-cyclic monophosphate;

2'-O-ethyladenosine-3',5'-cyclic monophosphate;

2'-O-n-propyladenosine-3',5'-cyclic monophosphate;

2'-O-n-butyladenosine-3',5'-cyclic monophosphate;

2'-O-iso-butyladenosine-3',5'-cyclic monophosphate;

2'-O-methyladenosine-3',5'-cyclic monophosphate methyl triester;

2'-O-methyladenosine-3',5'-cyclic monophosphate phenyl triester.

Claim 2 (Previously presented): The compound of claim 1, wherein

R₁ is H, halogen, azido, O-alkyl, O-aryl, S-alkyl, S-aryl, NH-alkyl, NH-aryl, Se-aryl.

Claim 3 (canceled):

Claim 4 (Previously presented): The compound of claim 1, wherein

R₁ is H, Br, Cl, I, azido, 2-chlorophenylthio, 3-chlorophenylthio, 4-chlorophenylthio, 2-bromophenylthio, 3-bromophenylthio, 4-bromophenylthio, methylamino, methylthio, ethylthio, n-

propylthio, n-butylthio, n-pentylthio, n-hexylthio, 2-fluorophenylthio, 3-fluorophenylthio, 4-fluorophenylthio, 4-methylcumarinyl, naphtyl-2-thio, phenylthio, 4-nitrophenylthio, 2-aminophenylthio, 3-aminophenylthio, 4-aminophenylthio, benzylthio, phenylethylamino, 3-phenyl-propylamino, 2-methoxyphenylthio, 3-methoxyphenylthio, 4-methoxyphenylthio, isopropylthio, benzimidazolyl-2-thio, 2-hydroxyethylthio, 2-aminoethylthio, pyridinylthio, benzothiazolylthio, 2-methylphenylthio, 3-methylphenylthio, 4-methylphenylthio, 2-isopropylphenylthio, 4-isopropylphenylthio, 2,3,5,6-tetrafluorophenylthio, 4-hydroxyphenylthio, 2,4-dichlorophenylthio, methoxy, ethoxy, propoxy, butoxy, benzyloxy, 4-methylbenzyloxy, 4-methoxybenzyloxy, 4-fluorobenzyloxy, 4-chlorobenzyloxy, 4-bromobenzyloxy, phenyloxy, cyclohexylamino, benzylamino, phenylseleno, 4-isopropoxyphenylthio, 4-methylthiophenylthio, 6-aminohexylamino, 2,3-dichlorophenylthio, 2,5-dichlorophenylthio, 2,4-difluorophenylthio, 2,5-dimethoxyphenylthio, 2,5-dimethylthiophenylthio, 2,6-dimethylthiophenylthio, 2,6-dichlorophenylthio.

Claim 5 (Previously presented): The compound of claim 1, wherein

R₁ is H, Br, Cl, azido, 2-chlorophenylthio, 3-chlorophenylthio, 4-chlorophenylthio, 2-bromophenylthio, 3-bromophenylthio, 4-bromophenylthio, methylamino, methylthio, ethylthio, n-propylthio, n-butylthio, n-pentylthio, n-hexylthio, 2-fluorophenylthio, 3-fluorophenylthio, 4-fluorophenylthio, 4-methylcumarinyl, naphtyl-2-thio, phenylthio, 4-nitrophenylthio, 2-aminophenylthio, 3-aminophenylthio, 4-aminophenylthio, benzylthio, phenylethylamino, 2-methoxyphenylthio, 3-methoxyphenylthio, 4-methoxyphenylthio, isopropylthio, benzimidazolyl-2-thio, 2-hydroxyethylthio, 2-aminoethylthio, pyridinylthio, benzothiazolylthio, 2-methylphenylthio, 3-methylphenylthio, 4-methylphenylthio, 2-isopropylphenylthio, 4-isopropylphenylthio, 2,3,5,6-tetrafluorophenylthio, 4-hydroxyphenylthio, 2,4-dichlorophenylthio, methoxy, benzyloxy, cyclohexylamino, benzylamino, phenylseleno, 4-isopropoxyphenylthio, 4-methylthiophenylthio, 6-aminohexylamino, 2,3-dichlorophenylthio, 2,5-dichlorophenylthio, 2,4-difluorophenylthio, 2,5-dimethoxyphenylthio, 2,5-dimethylthiophenylthio, 2,6-dimethylthiophenylthio, 2,6-dichlorophenylthio.

Claim 6 (Previously presented): The compound of claim 1, wherein

R₁ is H, Br, Cl, azido, 4-chlorophenylthio, methylamino, methylthio, 4-fluorophenylthio, 4-methylcumarinyl, naphtyl-2-thio, phenylthio, 4-nitrophenylthio, 2-aminophenylthio, benzylthio, n-hexylthio, phenylethylamino, 4-methoxyphenylthio, isopropylthio, benzimidazolyl-2-thio, 2-hydroxyethylthio, ethylthio, 2-aminoethylthio, pyridinylthio, benzothiazolylthio, 4-

methylphenylthio, 3-methoxyphenylthio, 4-isopropylphenylthio, 2,3,5,6-tetrafluorophenylthio, 4-hydroxyphenylthio, 2,4-dichlorophenylthio, methoxy, benzyloxy, cyclohexylamino, benzylamino, phenylseleno, 4-isopropoxyphenylthio, 4-methylthiophenylthio, 6-aminohexylamino.

Claim 7 (Previously presented): The compound of claim 1, wherein
R1 is Cl, Br or S-aryl.

Claim 8 (Previously presented): The compound of claim 1, wherein
R1 is Cl, Br, 4-chlorophenylthio, 4-fluorophenylthio, naphtyl-2-thio, phenylthio, 4-nitrophenylthio, 4-methoxyphenylthio, pyridinyl-2-thio, 4-methylphenylthio, 4-isopropylphenylthio, 2,3,5,6-tetrafluoro-phenylthio, 4-hydroxyphenylthio, or 2,4-dichlorophenylthio.

Claim 9 (Previously presented): The compound of claim 7, wherein
R1 is 4-chlorophenylthio, 4-fluorophenylthio, 4-methoxyphenylthio, 4-methylphenylthio, 4-hydroxyphenylthio.

Claim 10 (Previously presented): The compound of claim 1, wherein
R₂ is H, halogen, azido, O-alkyl, S-alkyl.

Claim 11 (Previously presented): The compound of claim 1, wherein
R₂ is H, Cl, Br, I, O-alkyl, S-methyl, S-ethyl.

Claim 12 (Previously presented): The compound of claim 1, wherein
R₂ is H, Cl, Br, O-methyl, O-ethyl, O-propyl, O-butyl, O-isobutyl, S-methyl.

Claim 13 (Previously presented): The compound of claim 1, wherein
R2 is O-methyl, O-ethyl, O-propyl, O-butyl, O-isobutyl.

Claim 14 (Previously presented): The compound of claim 1, wherein
R2 is O-methyl.

Claim 15 (Amended): The compound of claim 1, wherein

R₃ is amino, NH-alkyl, N-bisalkyl, NH-aryl, NH-alkyl-carbamoyl, N-bisalkyl-carbamoyl, amido-alkyl, amido-aryl, OH.

Claim 16 (Amended): The compound of claim 1, wherein

R₃ is amino, NH-phenyl, NH-tert-butyl, NH-tert-butylcarbamoyl, NH-phenylcarbamoyl, NH-acetyl, NH-propionyl, NH-butyryl, NH-benzoyl, NH-benzyl, NH-phenylethyl, NH-phenylpropyl, N-bismethyl, N-bisethyl, OH.

Claim 17 (Amended): The compound of claim 1, wherein

R₃ is amino, NH-phenyl, NH-tert-butyl, NH-tert-butylcarbamoyl, NH-phenylcarbamoyl, NH-butyryl, NH-benzoyl, NH-benzyl, N-bismethyl, N-bisethyl, OH.

Claim 18 (Amended): The compound of claim 1, wherein

R₃ is amino, NH-phenyl, NH-tert-butyl, NH-tert-butylcarbamoyl, NH-benzoyl, N-bismethyl, OH.

Claim 19 (Previously presented): The compound of claim 1, wherein R₃ is amino, NH-tert-butyl.

Claim 20 (Previously presented): The compound of claim 1, wherein R₄ and R₅ are independently O(H) or S(H).

Claim 21 (Previously presented): The compound of claim 1, wherein R₄ and R₅ are O(H).

Claim 22 (Amended): The compound of claim 1, wherein the compound is selected from the group consisting of:

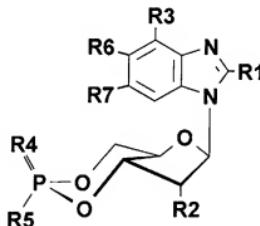
8-bromo-2'-deoxyadenosine-3',5'-cyclic monophosphate; 8-(4-chloro-phenylthio)-2'-deoxyadenosine-3',5'-cyclic monophosphate; 8-(4-chloro-phenylthio)-N⁶-phenyl-2'-deoxyadenosine-3',5'-cyclic monophosphate; 8-bromo-2'-O-methyladenosine-3',5'-cyclic monophosphate; 8-(4-chloro-phenylthio)-2'-O-methyladenosine-3',5'-cyclic monophosphate; 8-methylamine-2'-O-methyladenosine-3',5'-cyclic monophosphate; 8-methylthio-2'-O-methyladenosine-3',5'-cyclic monophosphate; 8-(4-fluoro-phenylthio)-2'-O-methyladenosine-3',5'-cyclic monophosphate; 8-(4-methyl-cumarinyl-7-thio)-2'-O-methyladenosine-3',5'-cyclic

monophosphate; 8-(napthyl-2-thio)-2'-O-methyladenosine-3',5'-cyclic monophosphate; 8-phenylthio-2'-O-methyladenosine-3',5'-cyclic monophosphate; 8-(4-nitro-phenylthio)-2'-O-methyladenosine-3',5'-cyclic monophosphate; 8-(2-amino-phenylthio)-2'-O-methyladenosine-3',5'-cyclic monophosphate; 8-benzylthio-2'-O-methyladenosine-3',5'-cyclic monophosphate; 8-n-hexylthio-2'-O-methyladenosine-3',5'-cyclic monophosphate; 8-phenylethylamine-2'-O-methyladenosine-3',5'-cyclic monophosphate; 8-(4-methoxy-phenylthio)-2'-O-methyladenosine-3',5'-cyclic monophosphate; 8-isopropylthio-2'-O-methyladenosine-3',5'-cyclic monophosphate; 8-(benzimidazolyl-2-thio)-2'-O-methyladenosine-3',5'-cyclic monophosphate; 8-(2-hydroxy-ethylthio)-2'-O-methyladenosine-3',5'-cyclic monophosphate; 8-ethylthio-2'-O-methyladenosine-3',5'-cyclic monophosphate; 8-(2-amino-ethylthio)-2'-O-methyladenosine-3',5'-cyclic monophosphate; 8-(pyridinyl-2-thio)-2'-O-methyladenosine-3',5'-cyclic monophosphate; 8-(benzothiazolyl-2-thio)-2'-O-methyladenosine-3',5'-cyclic monophosphate; 8-(4-methyl-phenylthio)-2'-O-methyladenosine-3',5'-cyclic monophosphate; 8-(3-methoxy-phenylthio)-2'-O-methyladenosine-3',5'-cyclic monophosphate; 8-(4-isopropyl-phenylthio)-2'-O-methyladenosine-3',5'-cyclic monophosphate; 8-(2,3,5,6-tetrafluoro-phenylthio)-2'-O-methyladenosine-3',5'-cyclic monophosphate; 8-(4-hydroxy-phenylthio)-2'-O-methyladenosine-3',5'-cyclic monophosphate; 8-(2,4-dichloro-phenylthio)-2'-O-methyladenosine-3',5'-cyclic monophosphate; 8-(4-chloro-phenylthio)-2'-(N,N-dimethyl)-carbamoyl-adenosine-3',5'-cyclic monophosphate; 8-methoxy-2'-O-methyladenosine-3',5'-cyclic monophosphate; benzeyloxy-2'-O-methyladenosine-3',5'-cyclic monophosphate; bromo-2'-O-methyladenosine-3',5'-cyclic monophosphorothioate, Sp-isomer; 8-bromo-2'-O-methyladenosine-3',5'-cyclic monophosphorothioate, Rp-isomer; 8-(4-chloro-phenylthio)-2'-O-methyladenosine-3',5'-cyclic monophosphorothioate, Sp-isomer; 8-(4-chloro-phenylthio)-2'-O-methyladenosine-3',5'-cyclic monophosphorothioate, Rp-isomer; 8-bromo-2'-deoxyadenosine-3',5'-cyclic monophosphorothioate, Rp-isomer; 8-bromo-2'-deoxyadenosine-3',5'-cyclic monophosphorothioate, Sp-isomer; 8-(4-chloro-phenylthio)-2'-deoxyadenosine-3',5'-cyclic monophosphorothioate, Rp-isomer; 8-(4-chloro-phenylthio)-2'-deoxyadenosine-3',5'-cyclic monophosphorothioate, Sp-isomer; 8-cyclohexylamino-2'-deoxyadenosine-3',5'-cyclic monophosphate; 8-chloro-2'-O-methyladenosine-3',5'-cyclic monophosphate; N⁶-tert-butyl-8-(4-chloro-phenylthio)-2'-deoxyadenosine-3',5'-cyclic monophosphate; 5,6-Dichloro-1-β-D-ribofuranosyl-2'-O-methylbenzimidazole-3',5'-cyclic monophosphate;
8-bromo-2'-deoxyadenosine-3',5'-cyclic monophosphate;
8-(4-chloro-phenylthio)-2'-deoxyadenosine-3',5'-cyclic monophosphate;
8-(4-chloro-phenylthio)-N⁶-phenyl-2'-deoxyadenosine-3',5'-cyclic monophosphate;
8-bromo-2'-O-methyladenosine-3',5'-cyclic monophosphate;

8-(4-chloro-phenylthio)-2'-O-methyladenosine-3',5'-cyclic monophosphate;
8-methylamino-2'-O-methyladenosine-3',5'-cyclic monophosphate;
8-methylthio-2'-O-methyladenosine-3',5'-cyclic monophosphate;
8-(4-fluoro-phenylthio)-2'-O-methyladenosine-3',5'-cyclic monophosphate;
8-(4-methyl-cumarinyl-7-thio)-2'-O-methyladenosine-3',5'-cyclic monophosphate;
8-(naphthyl-2-thio)-2'-O-methyladenosine-3',5'-cyclic monophosphate;
8-phenylthio-2'-O-methyladenosine-3',5'-cyclic monophosphate;
8-(4-nitro-phenylthio)-2'-O-methyladenosine-3',5'-cyclic monophosphate;
8-(2-amino-phenylthio)-2'-O-methyladenosine-3',5'-cyclic monophosphate;
8-benzylthio-2'-O-methyladenosine-3',5'-cyclic monophosphate;
8-n-hexylthio-2'-O-methyladenosine-3',5'-cyclic monophosphate;
8-phenylethylamino-2'-O-methyladenosine-3',5'-cyclic monophosphate;
8-(4-methoxy-phenylthio)-2'-O-methyladenosine-3',5'-cyclic monophosphate;
8-isopropylthio-2'-O-methyladenosine-3',5'-cyclic monophosphate;
8-(benzimidazolyl-2-thio)-2'-O-methyladenosine-3',5'-cyclic monophosphate;
8-(2-hydroxy-ethylthio)-2'-O-methyladenosine-3',5'-cyclic monophosphate;
8-ethylthio-2'-O-methyladenosine-3',5'-cyclic monophosphate;
8-(2-amino-ethylthio)-2'-O-methyladenosine-3',5'-cyclic monophosphate;
8-(pyridinyl-2-thio)-2'-O-methyladenosine-3',5'-cyclic monophosphate;
8-(benzothiazolyl-2-thio)-2'-O-methyladenosine-3',5'-cyclic monophosphate;
8-(4-methyl-phenylthio)-2'-O-methyladenosine-3',5'-cyclic monophosphate;
8-(3-methoxy-phenylthio)-2'-O-methyladenosine-3',5'-cyclic monophosphate;
8-(4-isopropyl-phenylthio)-2'-O-methyladenosine-3',5'-cyclic monophosphate;
8-(2,3,5,6-tetrafluoro-phenylthio)-2'-O-methyladenosine-3',5'-cyclic monophosphate;
8-(4-hydroxy-phenylthio)-2'-O-methyladenosine-3',5'-cyclic monophosphate;
8-(2,4-dichloro-phenylthio)-2'-O-methyladenosine-3',5'-cyclic monophosphate;
8-(4-chloro-phenylthio)-2'-(N,N-dimethyl)-carbamoyl-adenosine-3',5'-cyclic monophosphate;
8-methoxy-2'-O-methyladenosine-3',5'-cyclic monophosphate;
8-benzylxy-2'-O-methyladenosine-3',5'-cyclic monophosphate;
8-bromo-2'-O-methyladenosine-3',5'-cyclic monophosphorothioate, Sp-isomer;
8-bromo-2'-O-methyladenosine-3'-5'-cyclic monophosphorothioate, Rp-isomer,
8-(4-chloro-phenylthio)-2'-O-methyladenosine-3',5'-cyclic monophosphorothioate, Sp-isomer;
8-(4-chloro-phenylthio)-2'-O-methyladenosine-3',5'-cyclic monophosphorothioate, Rp-isomer;
8-bromo-2'-deoxyadenosine-3',5'-cyclic monophosphorothioate, Rp-isomer;

8-bromo-2'-deoxyadenosine-3',5'-cyclic monophosphorothioate, Sp-isomer;
8-(4-chloro-phenylthio)-2'-deoxyadenosine-3',5'-cyclic monophosphorothioate, Rp-isomer;
8-(4-chloro-phenylthio)-2'-deoxyadenosine-3',5'-cyclic monophosphorothioate, Sp-isomer;
8-cyclohexylamino-2'-deoxyadenosine-3',5'-cyclic monophosphate;
8-chloro-2'-O-methyladenosine-3',5'-cyclic monophosphate; and
N⁶-tert-butyl-8-(4-chloro-phenylthio)-2'-deoxyadenosine-3',5'-cyclic monophosphate.

Claim 23 (Withdrawn): The compound of claim 1, wherein the deaza-analogue is a compound having the structural formula II:



wherein

R1-R5 are as defined in claim 1, and wherein

R6 and R7 can be independently H, halogen, alkyl, nitro, amino, and/or alkoxy.

Claim 24 (Previously presented): The compound of claim 23, wherein

R1-R3 are as defined in claims 1;

R4 and R5 can be independently O or S; and

R6 and R7 can be independently F, Cl, Br or I.

Claim 25 (Withdrawn): The compound of claim 23, wherein R6 and R7 are Cl.

Claim 26 (Withdrawn): The compound of claim 23, wherein R2 is O-alkyl.

Claim 27 (Withdrawn): The compound of claim 23, wherein

R1 and R3 are hydrogen;

R2 is O-alkyl; and

R6 and R7 are Cl.

Claim 28 (Withdrawn): The compound of claim 23, wherein the deaza-analogue is selected from the group consisting of 1-deaza-adenine analogues, 3-deaza-adenine analogues, 7-deaza-adenine analogues, 1,3-dideaza-adenine analogues, 1,7-dideaza-adenosine analogues and benzimidazole analogues, preferably 5,6-dichlorobenzimidazole.

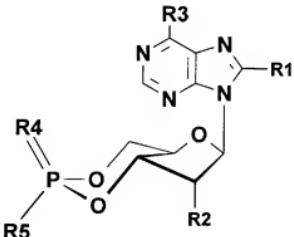
Claim 29 (Previously presented): The compound of claim 1, wherein said compound modulates the activity of exchange proteins directly activated by cAMP (Epacs).

Claim 30 (Previously presented): The compound of claim 1, wherein said compound discriminates between Epac- and PKA-mediated signal transduction pathways.

Claim 31 (canceled)

Claim 32 (Previously presented): A pharmaceutical composition comprising the compound of claim 1, and one or more pharmaceutically acceptable excipients.

Claim 33 (Amended): A method for treating a patient comprising administering a pharmaceutical compound comprising a compound having the structural formula (I)



wherein,

R_1 can be independently H, halogen, azido, alkyl, aryl, amido-alkyl, amido-aryl, OH, O-alkyl, O-aryl, SH, S-alkyl, S-aryl, SeH, Se-alkyl, Se-aryl, amino, NH-alkyl, NH-aryl, N-bisalkyl, N-bisaryl, cycloalkylamino;

R_2 can be independently H, halogen, azido, O-alkyl, S-alkyl, Se-alkyl, NH-alkyl, N-bisalkyl, alkyl-carbamoyl, cycloalkylamino, silyl;

R_3 can be independently H, halogen, OH, azido, amido-alkyl, amido-aryl, O-alkyl, O-aryl, SH, S-alkyl, S-aryl, amino, NH-alkyl, NH-aryl, N-bisalkyl, N-bisaryl, NH-alkyl-carbamoyl, cycloalkylamino;

and wherein

R_4 is O(H) or S(H); and

R_5 is O(H), S(H), amino, H, alkyl, O-alkyl, O-aryl, S-alkyl, S-aryl, NH-alkyl, NH-aryl, N-bisalkyl, N-bisaryl; or

R_6 is O(H), S(H), amino, H, alkyl, O-alkyl, O-aryl, S-alkyl, S-aryl, NH-alkyl, NH-aryl, N-bisalkyl, N-bisaryl; and

R_7 is O(H) or S(H); and pharmaceutically acceptable salts, esters, and/or solvates thereof.

Claim 34 (canceled)

Claim 35 (Previously presented): The method of claim 33, wherein

R_1 is H, halogen, azido, O-alkyl, O-aryl, S-alkyl, NH-alkyl, NH-aryl, Se-aryl.

Claim 36 (canceled)

Claim 37 (Previously presented): The method of claim 33, wherein

R_1 is H, Br, Cl, I, azido, 2-chlorophenylthio, 3-chlorophenylthio, 4-chlorophenylthio, 2-bromophenylthio, 3-bromophenylthio, 4-bromophenylthio, methylamino, methylthio, ethylthio, n-propylthio, n-butylthio, n-pentylthio, n-hexylthio, 2-fluorophenylthio, 3-fluorophenylthio, 4-fluorophenylthio, 4-methylcumarinyl, naphtyl-2-thio, phenylthio, 4-nitrophenylthio, 2-aminophenylthio, 3-aminophenylthio, 4-aminophenylthio, benzylthio, phenylethylamino, 3-phenyl-propylamino, 2-methoxyphenylthio, 3-methoxyphenylthio, 4-methoxyphenylthio, isopropylthio, benzimidazolyl-2-thio, 2-hydroxyethylthio, 2-aminoethylthio, pyridinylthio,

benzothiazolylthio, 2-methylphenylthio, 3-methylphenylthio, 4-methylphenylthio, 2-isopropylphenylthio, 4-isopropylphenylthio, 2,3,5,6-tetrafluorophenylthio, 4-hydroxyphenylthio, 2,4-dichlorophenylthio, methoxy, ethoxy, propoxy, butoxy, benzyloxy, 4-methylbenzyloxy, 4-methoxybenzyloxy, 4-fluorobenzyloxy, 4-chlorobenzyloxy, 4-bromobenzyloxy, phenyloxy, cyclohexylamino, benzylamino, phenylseleno, 4-isopropyloxyphenylthio, 4-methylthiophenylthio, 6-amino hexylamino, 2,3-dichlorophenylthio, 2,5-dichlorophenylthio, 2,4-difluorophenylthio, 2,5-dimethoxyphenylthio, 2,5-dimethylthiophenylthio, 2,6-dimethylthiophenylthio, 2,6-dichlorophenylthio.

Claim 38 (Previously presented): The method of claim 33, wherein

R₁ is H, Br, Cl, azido, 2-chlorophenylthio, 3-chlorophenylthio, 4-chlorophenylthio, 2-bromophenylthio, 3-bromophenylthio, 4-bromophenylthio, methylamino, methylthio, ethylthio, n-propylthio, n-butylthio, n-pentylthio, n-hexylthio, 2-fluorophenylthio, 3-fluorophenylthio, 4-fluorophenylthio, 4-methylcumarinyl, naphtyl-2-thio, phenylthio, 4-nitrophenylthio, 2-aminophenylthio, 3-aminophenylthio, 4-aminophenylthio, benzylthio, phenylethylamino, 2-methoxyphenylthio, 3-methoxyphenylthio, 4-methoxyphenylthio, isopropylthio, benzimidazolyl-2-thio, 2-hydroxyethylthio, 2-aminoethylthio, pyridinylthio, benzothiazolylthio, 2-methylphenylthio, 3-methylphenylthio, 4-methylphenylthio, 2-isopropylphenylthio, 4-isopropylphenylthio, 2,3,5,6-tetrafluorophenylthio, 4-hydroxyphenylthio, 2,4-dichlorophenylthio, methoxy, benzyloxy, cyclohexylamino, benzylamino, phenylseleno, 4-isopropyloxyphenylthio, 4-methylthiophenylthio, 6-amino hexylamino, 2,3-dichlorophenylthio, 2,5-dichlorophenylthio, 2,4-difluorophenylthio, 2,5-dimethoxyphenylthio, 2,5-dimethylthiophenylthio, 2,6-dimethylthiophenylthio, 2,6-dichlorophenylthio.

Claim 39 (Previously presented): The method of claim 33, wherein

R₁ is H, Br, Cl, azido, 4-chlorophenylthio, methylamino, methylthio, 4-fluorophenylthio, 4-methylcumarinyl, naphtyl-2-thio, phenylthio, 4-nitrophenylthio, 2-aminophenylthio, benzylthio, n-hexylthio, phenylethylamino, 4-methoxyphenylthio, isopropylthio, benzimidazolyl-2-thio, 2-hydroxyethylthio, ethylthio, 2-aminoethylthio, pyridinylthio, benzothiazolylthio, 4-methylphenylthio, 3-methoxyphenylthio, 4-isopropylphenylthio, 2,3,5,6-tetrafluorophenylthio, 4-hydroxyphenylthio, 2,4-dichlorophenylthio, methoxy, benzyloxy, cyclohexylamino, benzylamino, phenylseleno, 4-isopropyloxyphenylthio, 4-methylthiophenylthio, 6-amino hexylamino.

Claim 40 (Previously presented): The method of claim 33, wherein

R1 is Cl, Br or S-aryl.

Claim 41 (Previously presented): The method of claim 33, wherein

R1 is Cl, Br, 4-chlorophenylthio, 4-fluorophenylthio, naphtyl-2-thio, phenylthio, 4-nitrophenylthio, 4-methoxyphenylthio, pyridinyl-2-thio, 4-methylphenylthio, 4-isopropylphenylthio, 2,3,5,6-tetrafluoro-phenylthio, 4-hydroxyphenylthio, or 2,4-dichlorophenylthio.

Claim 42 (Previously presented): The method of claim 33-, wherein

R1 is 4-chlorophenylthio, 4-fluorophenylthio, 4-methoxyphenylthio, 4-methylphenylthio, 4-hydroxyphenylthio.

Claim 43 (Previously presented): The method of claim 33, wherein

R₂ is H, halogen, azido, O-alkyl, S-alkyl.

Claim 44 (Previously presented): The method of claim 33, wherein

R₂ is H, Cl, Br, I, O-alkyl, S-methyl, S-ethyl.

Claim 45 (Previously presented):. The method of claim 33, wherein

R₂ is H, Cl, Br, O-methyl, O-ethyl, O-propyl, O-butyl, O-isobutyl, S-methyl.

Claim 46 (Previously presented): The method of claim 33, wherein

R₂ is O-methyl, O-ethyl, O-propyl, O-butyl, O-isobutyl.

Claim 47 (Previously presented): The method of claim 33, wherein

R₂ is O-methyl.

Claim 48 (Amended): The method of claim 33, wherein

R₃ is amino, NH-alkyl, N-bisalkyl, NH-aryl, NH-alkyl-carbamoyl, N-bisalkyl-carbamoyl, amido-alkyl, amido-aryl, OH.

Claim 49 (Amended): The method of claim 33, wherein

R₃ is amino, NH-phenyl, NH-tert-butyl, NH-tert-butylcarbamoyl, NH-phenylcarbamoyl, NH-acetyl, NH-propionyl, NH-butyryl, NH-benzoyl, NH-benzyl, NH-phenylethyl, NH-phenylpropyl, N-bismethyl, N-bisethyl, -OH.

Claim 50 (Amended): The method of claim 33, wherein

R₃ is amino, NH-phenyl, NH-tert-butyl, NH-tert-butylcarbamoyl, NH-phenylcarbamoyl; NH-butyryl, NH-benzoyl, NH-benzyl, N-bismethyl, N-bisethyl, -OH.

Claim 51 (Amended): The method of claim 33, wherein

R₃ is amino, NH-phenyl, NH-tert-butyl, NH-tert-butylcarbamoyl, NH-benzoyl, N-bismethyl, -OH.

Claim 52 (Previously presented): The method of claim 33, wherein

R₃ is amino, NH-tert-butyl.

Claim 53 (Previously presented):. The method of claim 33, wherein

R₄ and R₅ are independently O(H) or S(H).

Claim 54 (Previously presented): The method of claim 33, wherein

R₄ and R₅ are O(H).

Claim 55 (Amended): . The method of claim 33, wherein the compound is selected from the group consisting of:

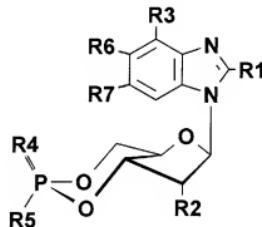
8-bromo-2'-deoxyadenosine 3',5'-cyclic monophosphate; 8-(4-chloro-phenylthio)-2'-deoxyadenosine 3',5'-cyclic monophosphate; 8-(4-chloro-phenylthio)-N⁶-phenyl-2'-deoxyadenosine 3',5'-cyclic monophosphate; 8-bromo-2'-O-methyladenosine 3',5'-cyclic monophosphate; 8-(4-chloro-phenylthio)-2'-O-methyladenosine 3',5'-cyclic monophosphate; 8-methylamino-2'-O-methyladenosine 3',5'-cyclic monophosphate; 8-methylthio-2'-O-methyladenosine 3',5'-cyclic monophosphate; 8-(4-fluoro-phenylthio)-2'-O-methyladenosine 3',5'-cyclic monophosphate; 8-(4-methyl-cumarinyl-7-thio)-2'-O-methyladenosine 3',5'-cyclic monophosphate; 8-(naphthyl-2-thio)-2'-O-methyladenosine 3',5'-cyclic monophosphate; 8-phenylthio-2'-O-methyladenosine 3',5'-cyclic monophosphate; 8-(4-nitro-phenylthio)-2'-O-methyladenosine 3',5'-cyclic monophosphate; 8-(2-amino-phenylthio)-2'-O-methyladenosine 3',5'-cyclic monophosphate; 8-benzylthio-2'-O-methyladenosine 3',5'-cyclic monophosphate; 8-

n-hexylthio-2'-O-methyladenosine-3',5'-cyclic monophosphate; 8-phenylethylamine-2'-O-methyladenosine-3',5'-cyclic monophosphate; 8-(4-methoxy-phenylthio)-2'-O-methyladenosine-3',5'-cyclic monophosphate; 8-isopropylthio-2'-O-methyladenosine-3',5'-cyclic monophosphate; 8-(benzimidazolyl-2-thio)-2'-O-methyladenosine-3',5'-cyclic monophosphate; 8-(2-hydroxy-ethylthio)-2'-O-methyladenosine-3',5'-cyclic monophosphate; 8-ethylthio-2'-O-methyladenosine-3',5'-cyclic monophosphate; 8-(2-amino-ethylthio)-2'-O-methyladenosine-3',5'-cyclic monophosphate; 8-(pyridinyl-2-thio)-2'-O-methyladenosine-3',5'-cyclic monophosphate; 8-(benzothiazolyl-2-thio)-2'-O-methyladenosine-3',5'-cyclic monophosphate; 8-(4-methyl-phenylthio)-2'-O-methyladenosine-3',5'-cyclic monophosphate; 8-(3-methoxy-phenylthio)-2'-O-methyladenosine-3',5'-cyclic monophosphate; 8-(4-isopropyl-phenylthio)-2'-O-methyladenosine-3',5'-cyclic monophosphate; 8-(2,3,5,6-tetrafluoro-phenylthio)-2'-O-methyladenosine-3',5'-cyclic monophosphate; 8-(4-hydroxy-phenylthio)-2'-O-methyladenosine-3',5'-cyclic monophosphate; 8-(2,4-dichloro-phenylthio)-2'-O-methyladenosine-3',5'-cyclic monophosphate; 8-(4-chloro-phenylthio)-2'-(N,N-dimethyl)-carbamoyl-adenosine-3',5'-cyclic monophosphate; 8-methoxy-2'-O-methyladenosine-3',5'-cyclic monophosphate; 8-benzyleoxy-2'-O-methyladenosine-3',5'-cyclic monophosphate; 8-bromo-2'-O-methyladenosine-3',5'-cyclic monophosphorothioate, Sp-isomer; 8-bromo-2'-O-methyladenosine-3',5'-cyclic monophosphorothioate, Rp-isomer; 8-(4-chloro-phenylthio)-2'-O-methyladenosine-3',5'-cyclic monophosphorothioate, Sp-isomer; 8-(4-chloro-phenylthio)-2'-O-methyladenosine-3',5'-cyclic monophosphorothioate, Rp-isomer; 8-bromo-2'-deoxyadenosine-3',5'-cyclic monophosphorothioate, Rp-isomer; 8-bromo-2'-deoxyadenosine-3',5'-cyclic monophosphorothioate, Sp-isomer; 8-(4-chloro-phenylthio)-2'-deoxyadenosine-3',5'-cyclic monophosphorothioate, Rp-isomer; 8-(4-chloro-phenylthio)-2'-deoxyadenosine-3',5'-cyclic monophosphorothioate, Sp-isomer; 8-cyclohexylamino-2'-deoxyadenosine-3',5'-cyclic monophosphate; 8-chloro-2'-O-methyladenosine-3',5'-cyclic monophosphate, N^t-tert-butyl-8-(4-chloro-phenylthio)-2'-deoxyadenosine-3',5'-cyclic monophosphate;
8-bromo-2'-deoxyadenosine-3',5'-cyclic monophosphate;
8-(4-chloro-phenylthio)-2'-deoxyadenosine-3',5'-cyclic monophosphate;
8-(4-chloro-phenylthio)-N^t-phenyl-2'-deoxyadenosine-3',5'-cyclic monophosphate;
8-bromo-2'-O-methyladenosine-3',5'-cyclic monophosphate;
8-(4-chloro-phenylthio)-2'-O-methyladenosine-3',5'-cyclic monophosphate;
8-methylamino-2'-O-methyladenosine-3',5'-cyclic monophosphate;
8-methylthio-2'-O-methyladenosine-3',5'-cyclic monophosphate;
8-(4-fluoro-phenylthio)-2'-O-methyladenosine-3',5'-cyclic monophosphate;
8-(4-methyl-cumarinyl-7-thio)-2'-O-methyladenosine-3',5'-cyclic monophosphate;

8-(naphtyl-2-thio)-2'-O-methyladenosine-3',5'-cyclic monophosphate;
8-phenylthio-2'-O-methyladenosine-3',5'-cyclic monophosphate;
8-(4-nitro-phenylthio)-2'-O-methyladenosine-3',5'-cyclic monophosphate;
8-(2-amino-phenylthio)-2'-O-methyladenosine-3',5'-cyclic monophosphate;
8-benzylthio-2'-O-methyladenosine-3',5'-cyclic monophosphate;
8-n-hexylthio-2'-O-methyladenosine-3',5'-cyclic monophosphate;
8-phenylethylamino-2'-O-methyladenosine-3',5'-cyclic monophosphate;
8-(4-methoxy-phenylthio)-2'-O-methyladenosine-3',5'-cyclic monophosphate;
8-isopropylthio-2'-O-methyladenosine-3',5'-cyclic monophosphate;
8-(benzimidazolyl-2-thio)-2'-O-methyladenosine-3',5'-cyclic monophosphate;
8-(2-hydroxy-ethylthio)-2'-O-methyladenosine-3',5'-cyclic monophosphate;
8-ethylthio-2'-O-methyladenosine-3',5'-cyclic monophosphate;
8-(2-amino-ethylthio)-2'-O-methyladenosine-3',5'-cyclic monophosphate;
8-(pyridinyl-2-thio)-2'-O-methyladenosine-3',5'-cyclic monophosphate;
8-(benzothiazolyl-2-thio)-2'-O-methyladenosine-3',5'-cyclic monophosphate;
8-(4-methyl-phenylthio)-2'-O-methyladenosine-3',5'-cyclic monophosphate;
8-(3-methoxy-phenylthio)-2'-O-methyladenosine-3',5'-cyclic monophosphate;
8-(4-isopropyl-phenylthio)-2'-O-methyladenosine-3',5'-cyclic monophosphate;
8-(2,3,5,6-tetrafluoro-phenylthio)-2'-O-methyladenosine-3',5'-cyclic monophosphate;
8-(4-hydroxy-phenylthio)-2'-O-methyladenosine-3',5'-cyclic monophosphate;
8-(2,4-dichloro-phenylthio)-2'-O-methyladenosine-3',5'-cyclic monophosphate;
8-(4-chloro-phenylthio)-2'-(N,N-dimethyl)-carbamoyl-adenosine-3',5'-cyclic monophosphate;
8-methoxy-2'-O-methyladenosine-3',5'-cyclic monophosphate;
8-benzylxy-2'-O-methyladenosine-3',5'-cyclic monophosphate;
8-bromo-2'-O-methyladenosine-3',5'-cyclic monophosphorothioate, Sp-isomer;
8-bromo-2'-O-methyladenosine-3',5'-cyclic monophosphorothioate, Rp-isomer;
8-(4-chloro-phenylthio)-2'-O-methyladenosine-3',5'-cyclic monophosphorothioate, Sp-isomer;
8-(4-chloro-phenylthio)-2'-O-methyladenosine-3',5'-cyclic monophosphorothioate, Rp-isomer;
8-bromo-2'-deoxyadenosine-3',5'-cyclic monophosphorothioate, Rp-isomer;
8-bromo-2'-deoxyadenosine-3',5'-cyclic monophosphorothioate, Sp-isomer;
8-(4-chloro-phenylthio)-2'-deoxyadenosine-3',5'-cyclic monophosphorothioate, Rp-isomer;
8-(4-chloro-phenylthio)-2'-deoxyadenosine-3',5'-cyclic monophosphorothioate, Sp-isomer;
8-cyclohexylamino-2'-deoxyadenosine-3',5'-cyclic monophosphate;
8-chloro-2'-O-methyladenosine-3',5'-cyclic monophosphate, and

N⁶-tert-butyl-8-(4-chloro-phenylthio)-2'-deoxyadenosine-3',5'-cyclic monophosphate.

Claim 56 (Withdrawn): The method of Claim 33, wherein the deaza analogue is a compound having the structural formula II:



wherein

R1-R5 are as defined in claim1, and wherein

R6 and R7 can be independently H, halogen, alkyl, nitro, amino, and/or alkoxy.

Claim 57 (Withdrawn): The method of claim 56, wherein

R1-R3 are as defined in claim1;

R4 and R5 can be independently O or S; and

R6 and R7 can be independently F, Cl, Br or I.

Claim 58 (Withdrawn): The method of claim 56-, wherein R6 and R7 are Cl.

Claim 59 (Withdrawn): The method of claim 56, wherein R2 is O-alkyl.

Claim 60 (Withdrawn): The method of claim 56, wherein

R1 and R3 are hydrogen;

R2 is O-alkyl; and

R6 and R7 are Cl.

Claim 61 (Withdrawn): The method of claim 56, wherein the deaza-analogue is selected from the group consisting of 1-deaza-adenine analogues, 3-deaza-adenine analogues,

7-deaza-adenine analogues, 1,3-dideaza-adenine analogues, 1,7-dideaza-adenosine analogues and benzimidazole analogues, preferably 5,6-dichlorobenzimidazole.

Claim 62 (Amended): The method of claims 33 or 56 for the treatment of cancer.

Claim 63 (Amended): The method of claims 33 or 56 for the treatment of chronic inflammation.

Claim 64 (Amended): The method of claims 33 or 56 for the treatment of thrombosis.

Claim 65 (Amended): The method of claims 33 or 56 for the treatment of type-2 diabetes mellitus.

Claim 66 (Previously presented): The method of claim 33 wherein said treating is of a human disease.